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formed below said main body-side shutter, the developer in said developer cartridge is supplied from the developer replenishment port to said developing unit via the developer outlet hole and the hole of said main body-side shutter.

2. A developer cartridge according to claim 1, wherein a diameter a of the developer outlet hole, a diameter b of the hole of said main body-side shutter, and a diameter c of the developer replenishment port satisfy a relation of $a \leq b \leq c$.

3. A developer cartridge according to claim 1, wherein said cartridge-side shutter has a hole, and fits on said cylindrical cartridge main body so the hole is movable between an opening position where the hole aligns itself with the developer outlet hole and a closing position.

4. A developer cartridge according to claim 3, wherein a diameter a of the developer outlet hole, a diameter d of the hole of said cartridge-side shutter, a diameter b of the hole of said main body-side shutter, and a diameter c of the developer replenishment port satisfy a relation of $a \leq d \leq b \leq c$.

5. A developer cartridge according to claim 1, wherein a spiral is formed on an inner surface of said cylindrical cartridge main body.

6. A developer cartridge according to claim 1, wherein said guide and said driving unit

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are integrated.

7. A developer cartridge according to claim 1,
wherein a toner scattering prevention seal is attached
near the developer outlet hole of said cylindrical
cartridge main body.

8. A developer cartridge according to claim 1,
wherein said main body-side shutter is made of an
elastic material.

9. A developer cartridge according to claim 1,
wherein said cylindrical cartridge main body is
supported by a roller which is in contact with the
outer surface and made of an elastic material.

10. A developer cartridge according to claim 1,
wherein a projection for preventing said cartridge-side
shutter from slipping off is formed on the outer
surface near said one end of said cylindrical cartridge
main body.

11. A developer cartridge according to claim 1,
wherein an inner surface of said cartridge-side shutter
and a surface of said cylindrical cartridge main body
along which said cartridge-side shutter moves are
threaded to mesh with each other, and said cartridge-
side shutter is rotated to move on the surface of said
cylindrical cartridge main body and stops at an
unthreaded portion.

12. An image forming apparatus comprising
a developing unit for developing an electrostatic

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Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099
1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	

wherein said developing unit has a developer cartridge rotatably mounted to supply the developer to said developing unit while rotating, a guide for inserting said developer cartridge, and a driving unit for rotating said developer cartridge;

said developer cartridge has a cylindrical cartridge main body having a developer inlet hole in an outer surface near one end, and a ring-like cartridge-side shutter which is fitted on the outer surface near said one end of said cylindrical cartridge main body to be movable along a rotating shaft of said cylindrical cartridge main body between a position where the developer outlet hole is opened and a position where the developer outlet hole is closed;

said guide has a main body-side shutter with
a hole; and

when said developer cartridge is mounted, said cartridge-side shutter of said cylindrical cartridge main body moves from the position where the developer outlet hole is closed to the position where the developer outlet hole is opened, the developer outlet hole aligns itself with the hole of said main body-side shutter, and every time said cylindrical cartridge main body and said main body-side shutter integrally rotate

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5 to align the developer outlet hole and the hole of said main body-side shutter with a developer replenishment port formed below said main body-side shutter, the developer in said developer cartridge is supplied from the developer replenishment port to said developing unit via the developer outlet hole and the hole of said main body-side shutter.

10 13. An image forming apparatus according to claim 12, wherein a diameter a of the developer outlet hole, a diameter b of the hole of said main body-side shutter, and a diameter c of the developer replenishment port satisfy a relation of $a \leq b \leq c$.

15 14. An image forming apparatus according to claim 12, wherein said cartridge-side shutter has a hole, and fits on said cylindrical cartridge main body so the hole is movable between an opening position where the hole aligns itself with the developer outlet hole and a closing position.

20 15. An image forming apparatus according to claim 14, wherein a diameter a of the developer outlet hole, a diameter d of the hole of said cartridge-side shutter, a diameter b of the hole of said main body-side shutter, and a diameter c of the developer replenishment port satisfy a relation of $a \leq d \leq b \leq c$.

25 16. An image forming apparatus according to claim 12, wherein a spiral is formed on an inner surface of said cylindrical cartridge main body.

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17. An image forming apparatus according to claim 12, wherein said guide and said driving unit are integrated.

5 18. An image forming apparatus according to claim 12, wherein a toner scattering prevention seal is attached near the developer outlet hole of said cylindrical cartridge main body.

10 19. An image forming apparatus according to claim 12, wherein said main body-side shutter is made of an elastic material.

20. An image forming apparatus according to claim 12, wherein said cylindrical cartridge main body is supported by a roller which is in contact with the outer surface and made of an elastic material.

15 20²¹. An image forming apparatus according to claim 12, wherein a projection for preventing said cartridge-side shutter from slipping off is formed on the outer surface near said one end of said cylindrical cartridge main body.

20 21²². An image forming apparatus according to claim 12, wherein an inner surface of said cartridge-side shutter and a surface of said cylindrical cartridge main body along which said cartridge-side shutter moves are threaded to mesh with each other, and
25 said cartridge-side shutter is rotated to move on the surface of said cylindrical cartridge main body and stops at an unthreaded portion.

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